

*Encephalartos brevifoliolatus* (Zamiaceae): a new species from the Northern Province

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*Encephalartos brevifoliolatus* is described from the Northern Province. It resembles *E. laevifolius* Stapf & Burtt-Davy in having practically identical male cones, slender but rigid and spineless petioles with a whitish felt-like indumentum when young, and relatively narrow and entire leaflets which are abaxially finely ribbed. It differs from *E. laevifolius* and related species in its conspicuously wider and shorter leaflets with revolute margins.

**Keywords:** *Encephalartos*, new species, Zamiaceae.

Field surveys by staff of the former Transvaal Chief Directorate of Nature and Environmental Conservation revealed the existence of a distinct new species of *Encephalartos* (Zamiaceae).

*Encephalartos brevifoliolatus* Vorster, sp. nov.

Plantae arborescentes, truncus ad 2.5 m altus. Folia petiolata, atrovirida; foliola integra, 60–80 mm longa et 10–12 mm lata. Microstrobili usque ad 6, pedunculati; bullae extensae, dense villosae bubalinae. Megastrobili incognitae.

*Encephalartos laevifolius* Stapf & Burtt-Davy similis microstrobilis fere similibus; sed differt foliis valde brevioribus et latioribus et marginis revolutioribus.

TYPUS.— Transvaal: precise locality withheld, Vorster 2984 (PRE, holotypus; K, isotypus).

Plant arborescent, unbranched but often suckering from base to form clumps of up to 6 stems. Stem erect but often leaning to some extent or even pendulous from cliffs, up to 2.5 m tall and 250–300 mm thick, covered by relatively small remains of leaf bases which are often charred from fires in its grassland habitat; crown not woolly but cataphylls initially covered by a thin, whitish, felt-like indumentum. Leaves 800–900 (–1 200?) mm long, rigid and straight or very slightly recurved near apices; petioles unarmed, hemiterete, initially with a whitish felt-like indumentum but glabrous at maturity, yellowish, 90–200 mm long and 7–10 mm thick; rachis yellowish; basal leaflets very slightly reduced in size but not to prickles; median leaflets incubously overlapping, spaced 8–10 mm apart, directed towards apex of leaf at angle of about 45°, opposing leaflets set at angle of about 135° to each other, dark green, very narrowly ovate and somewhat falcate with margins entire and revolute and apices acute and pungent, abaxially finely ribbed with (12–)14–16 veins, 60–80 mm long and 10–12 mm wide. Male cones up to 6 per stem seen, sessile, very narrowly ovoid, covered in minute and very short whitish felt-like indumentum, about 350 mm long and 60–70 mm in diameter in dried state; exposed faces of median microsporophylls rhombic, about 22 mm wide and 5 mm high, drawn out to a length of about 6 mm to the central facet; central facet rhombic, smooth, 7–9 mm wide and 3–5 mm wide. Female cones unknown. (Figures 1 & 2).

## Phenology

In mid-May plants carried still-intact but completely dried out male cones. In view of its apparent affinities with *E. laevifolius* Stapf & Burtt-Davy (see below), it is likely that cones are produced and matured within a few months in spring and early summer, unlike in most other species where cones are produced in

late summer and autumn, with pollination taking place in autumn and the female cones maturing throughout the winter months and shedding the seeds early in the following summer. The plants seen were mature but widely separated, and no sign of female cones was found, even though the area where the plants grow has been visited repeatedly since 1989 by Mr S.P. Fourie and his staff (see Acknowledgements below). Not surprisingly, no evidence of recent seedling regeneration was apparent.

## Diagnostic features and affinities

*E. brevifoliolatus* resembles *E. laevifolius* in its practically identical male cones (Figure 1c & d), thin but rigid and spineless petioles with whitish wool when young (Figure 2a), and relatively narrow and entire leaflets (Figure 2b) which are abaxially finely ribbed. It differs from *E. laevifolius* and related species in its conspicuously wider and shorter leaflets with revolute margins, and the greater number of veins to the pinnae [(12–)14–16 instead of 10–12 (Dyer 1965, 1966)].

Mention should be made of plants occurring on the north-eastern Drakensberg of the Northern Province, and assigned to *E. laevifolius*. These represent a series of outlying populations of *E. laevifolius*, and differ from material at the type locality in their dark green instead of glaucous foliage, as well as the densely velvety and somewhat differently shaped cones. Since this author discovered the first plants in 1969, they have been studied intensively; but in spite of their superficial dissimilarity to material from the type locality, the discontinuity in character states is considered insufficient to justify taxonomic separation. There is also some variation in the length/width ratio of the leaflets between populations of *E. laevifolius* along its geographical cline, but nowhere does it approach that of *E. brevifoliolatus*.

The possibility was considered that the meagre material represents a hybrid, with *E. laevifolius* as one of the parents, because the width/length ratio of the leaflets is larger than any ever recorded in the *E. laevifolius* group, comprising in addition *E. lanatus* Stapf & Burtt-Davy, *E. humilis* Verdoorn, *E. friderici-guilielmii* Lehm., and perhaps *E. cycadifolius* (Jacq.) Lehm. and *E. ghellinkii* Lem. Arguments against this assumption are that there are no suitable putative parents growing nearby, that apart from the wider leaflets, it shows no similarity to any species outside the *E. laevifolius* group, and that the reproductive cycle of this group is half a year out of phase with that of the remaining species, so that natural hybridizing is unlikely.

## Geographical distribution and habitat

*E. brevifoliolatus* is known from five individuals which occur widely scattered over a few square kilometers on the Drakens-

berg escarpment in the Northern Province (Figure 3). In consideration of its vulnerable conservation status, the locality cannot be divulged in greater detail. It grows in short grassland, in very

open *Protea* savanna (Figure 1a & b), on quartzite-derived sandstone, or on cliffs, in direct sunlight, at elevations of 1 300 to 1 500 m.

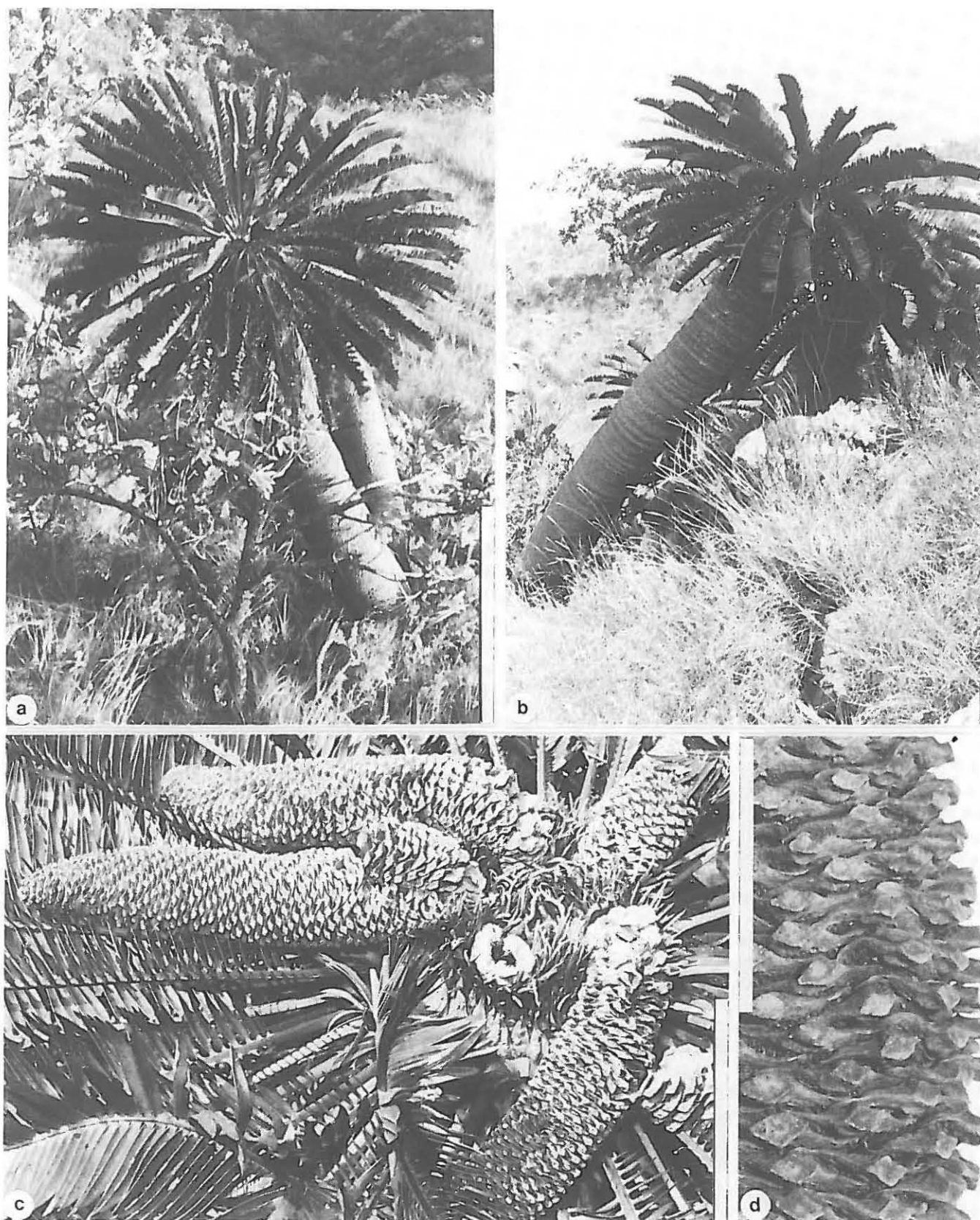


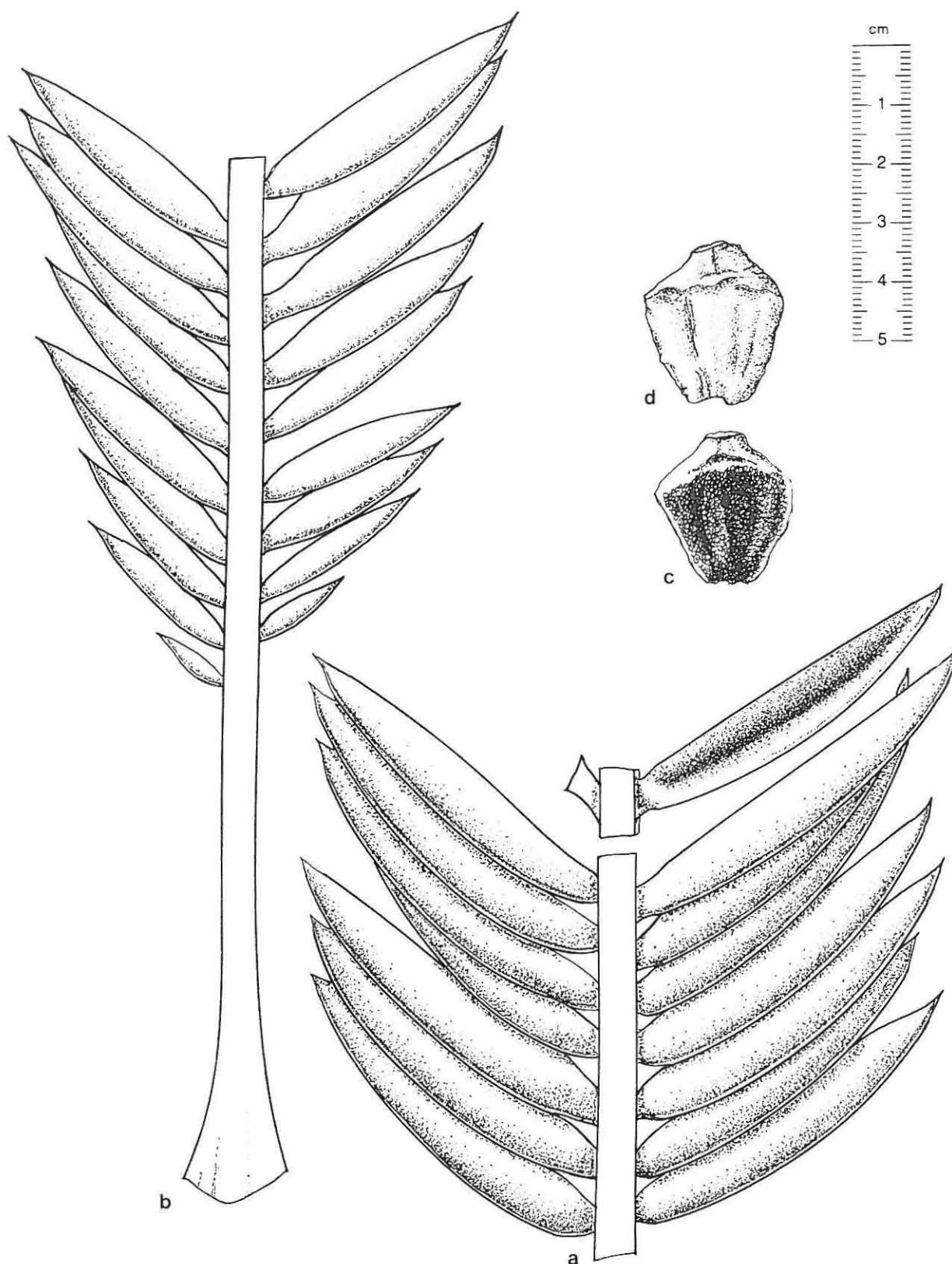
Figure 1 *Encephalartos brevifoliolatus*: (a), (b) plants in habitat; (c) crown of stem showing four dried male cones; (d) portion of dried male cone, showing exposed faces of microsporophylls drawn out about 6 mm to the central facet,  $\times 1$ . Scale bars: a, b = 1 m; c = 100 mm; d = 50 mm.

### Conservation status

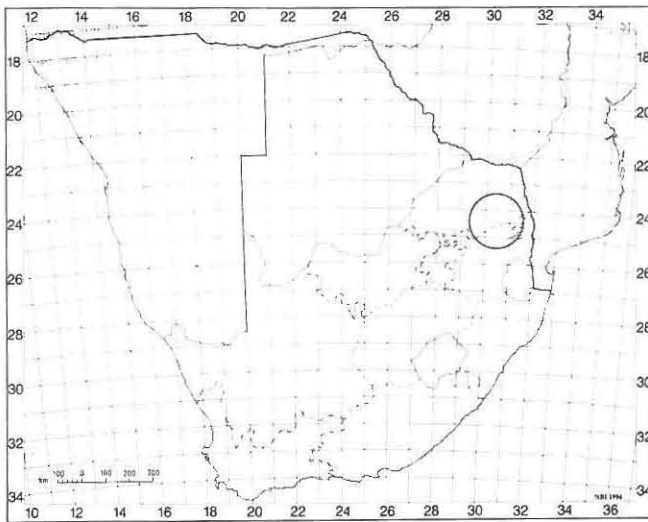
The fact that, in spite of a diligent aerial search, only five widely separated specimens could be located, coupled to the lack of evidence for the survival of female plants, leads to the conclusion that the conservation status of this species is extremely precarious.

For this reason we keep the locality secret, on a need-to-know basis.

The general area where this species was found is rich in relic endemic species of *Encephalartos*. The fact that several of these were brought to the attention of the scientific world through the



**Figure 2** *Encephalartos brevifoliolatus*: (a) median portion of leaf in abaxial view, showing short, wide, and incubously overlapping leaflets; (b) basal portion of leaf, showing unarmed petiole and rather slight reduction in size of leaflets; (c), (d) abaxial and adaxial views respectively of microsporophyll. Del. E.C. Vorster.



**Figure 3** *Encephalartos brevifoliolatus*: map showing approximate location of known plants.

illegal activities of amateur collectors is poor consolation for the havoc which they wreaked, to the extent that more than one species has been so reduced in numbers that it is no longer possible to study the plants in their natural habitat. *E. brevifoliolatus* is

indeed already represented in at least one private collection but not in any scientific collection, and in view of the disastrous removal of an outlying population of *E. laevifolius* from Kwa-Zulu/Natal in the name of conservation, I would not recommend removal of any material from nature unless it proves impossible to protect the plants *in situ*.

#### Material examined

Locality withheld. *Fourie 4002* (leaf material) (PRE), *4003* (leaf material) (K, PRE), *Vorster 2984* (leaf material and microsporophylls – type) (K; PRE).

#### Acknowledgements

Full credit for the discovery of this species is due to Mr S.P. Fourie of the former Transvaal Chief Directorate of Nature and Environmental Conservation. He located the plants, brought them to the author's attention, collected herbarium material, and arranged for the author to see the plants in nature. The continued existence in nature of this species depends on his efforts. The continuing research, of which this article is a result, is financed by the University of Stellenbosch and the Foundation for Research Development.

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